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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/971,953	10/05/2001	Paul S. Andry	JP9-2000-0187US1 (8728-42)	4099
7590	12/31/2003			EXAMINER MALDONADO, JULIO J
Frank Chau F. CHAU & ASSOCIATES, LLP Suite 501 1900 Hempstead Turnpike East Meadow, NY 11554			ART UNIT 2823	PAPER NUMBER
			DATE MAILED: 12/31/2003	

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/971,953	ANDRY ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Julio J. Maldonado	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 29 September 2003.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-13, 15-17 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-13, 15-17 and 22 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. §§ 119 and 120

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
 a) The translation of the foreign language provisional application has been received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)      4) Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_ .  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)      5) Notice of Informal Patent Application (PTO-152)  
 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.      6) Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 4-7, 9-17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calvert et al. (U.S. 6,348,240 B1) in view of the applicants' admitted prior art.

In reference to claims 1, 2, 4, 6, 9-17 and 22, Calvert et al. (Fig.1) in a related method to selectively deposit a conductive layer teach providing a substrate (column 7, lines 17 – 20); forming a first insulation layer on a substrate, wherein said layer is a diamond layer (column 7, lines 17 – 20); forming a second insulation layer on the first insulation layer, the second insulation layer having predetermined functional groups comprising OH functional groups (column 5, lines 15 – 34); etching the second insulation layer in accordance with the patterns of a patterned mask to create a patterned insulation layer (column 6, lines 5 – 22); treating the patterned insulation layer with a silane coupling agent reacting with the predetermined functional groups (column 5, lines 42 – 65); treating the patterned insulation layer with a catalyst-containing solution, wherein said catalyst containing solution includes palladium dichloride (column 6, lines 23 – 34); and depositing electrically conductive material on the patterned

insulation layer (column 5, line 15 – column 7, line 40), wherein the electrically conductive material comprises gold (Au) (column 2, lines 16 – 19).

Calvert et al. fail to teach forming a patterned polymer layer by photolithography having patterns on the second insulation layer; and striping the patterned polymer layer to expose the patterned insulation layer. However, the admitted prior art (Figs.1a-h) teaches the steps of providing a substrate (103); forming an insulation layer (101) on the substrate (103); forming a patterned polymer layer (109) by photolithography having the patterns on the insulation layer (101); etching the insulation layer (101) in accordance with the patterns of the patterned polymer layer (109) to create a patterned insulation layer; and stripping the patterned polymer layer (109) to expose the patterned insulation layer (page 1, line 10 – page 3, line 8). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the patterned polymer layer as taught in the prior art to pattern the second insulation layer in the selective deposition process of Calvert et al., since this process involves conventional processes in the formation of patterns using photolithography (page 1, lines 16 – 17).

In reference to claims 5 and 7, the combined teachings of Calvert et al. and the prior art substantially teach all aspects of the invention but fail to teach the second insulation layer having a thickness between about 1 nm and about 10 nm; and the patterned polymer layer having a thickness between about 50 nm and 100 nm. Notwithstanding, it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and

optimization to choose these particular dimensions because applicant has not disclosed that the dimensions are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it appears *prima facie* that the process would possess utility using another dimension. Indeed, it has been held that mere dimensional limitations are *prima facie* obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Calvert et al. (U.S. 6,348,240 B1) in view of the prior art as applied to claims 1, 2, 4-7, 9-17 and 22 above, and further in view of Schnur et al. (U.S. 5,079,600).

The combined teachings of Calvert et al. and the prior art teach that the second insulating layer is an oxide but fail to teach that said oxide is a silicon oxide. However, Schnur et al. (Figs.1-5) teach a selective deposition process including selectively depositing a metal over a functional layer, wherein the functional layer includes silicon oxide (column 8, lines 27 – 41). It would have been within the scope of one of ordinary skill in the art to combine the teachings of Calvert et al. and the prior art with the teachings of Schnur et al. to enable the use of silicon oxide as the second insulation layer in Calvert et al. and the prior art to be performed according to the teachings of Schnur et al. because one of ordinary skill in the art would have been motivated to look

to alternative suitable methods of forming the second insulation layer of Calvert et al. and the prior art, and art recognized suitability for an intended purpose has been recognized to be motivation to combine. MPEP 2144.07.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Calvert et al. (U.S. 6,348,240 B1) in view of the prior art and Nagura (U.S. 5,841,856).

Calvert et al. (Fig.1) in a related method to selectively deposit a conductive layer teach providing a substrate (column 7, lines 17 – 20); forming a first insulation layer on a substrate, wherein said layer is a diamond layer (column 7, lines 17 – 20); forming a second insulation layer on the first insulation layer, the second insulation layer having predetermined functional groups comprising OH functional groups (column 5, lines 15 – 34); etching the second insulation layer in accordance with the patterns of a patterned mask to create a patterned insulation layer (column 6, lines 5 – 22); treating the patterned insulation layer with a silane coupling agent reacting with the predetermined functional groups (column 5, lines 42 – 65); treating the patterned insulation layer with a catalyst-containing solution, wherein said catalyst containing solution includes palladium dichloride (column 6, lines 23 – 34); and depositing electrically conductive material on the patterned insulation layer (column 5, line 15 – column 7, line 40), wherein the electrically conductive material comprises gold (Au) (column 2, lines 16 – 19).

Calvert et al. fail to teach forming a patterned polymer layer by photolithography having patterns on the second insulation layer; and striping the patterned polymer layer to expose the patterned insulation layer. However, the admitted prior art (Figs.1a-h) teaches the steps of providing a substrate (103); forming an insulation layer (101) on

the substrate (103); forming a patterned polymer layer (109) by photolithography having the patterns on the insulation layer (101); etching the insulation layer (101) in accordance with the patterns of the patterned polymer layer (109) to create a patterned insulation layer; and stripping the patterned polymer layer (109) to expose the patterned insulation layer (page 1, line 10 – page 3, line 8). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the patterned polymer layer as taught in the prior art to pattern the second insulation layer in the selective deposition process of Calvert et al., since this process involves conventional processes in the formation of patterns using photolithography (page 1, lines 16 – 17).

The combined teachings of Calvert et al. and the prior art fail to teach wherein the patterned polymer layer comprises a polyimide. However, Nagura (Figs.1B-1F) in a related patterning process teaches forming a patterned polymer layer (4a) over a silicon oxide layer (3), wherein said polymer layer comprises a polyimide (column 4, line 59 – 61). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the polyimide layer as taught by Nagura to etch the second insulating layer of Calvert et al. and the prior art, since this would provide appropriate etching of the exposed areas of the insulating layer (column 4, lines 56 – 67).

***Response to Arguments***

5. Applicant's arguments filed 09/08/2003 have been fully considered but they are not persuasive.

Applicants argue, "... Calvert discloses that the diamond substrate, or diamond layer, is oxidized and functional groups are attached to the diamond surface, a mask is then formed and patterned on the diamond surface to modify the surface after the functional groups have been attached, and the remaining functional diamond surface is catalyzed to facilitate metallizing the surface. In other words, Calvert's diamond surface is a functional layer, and not a non-functional layer. Thus, Calvert does not disclose or suggest forming a non-functional layer on the substrate, much less forming a functional insulating layer having predetermined functional groups on the non-functional insulating layer. Since Calvert does not disclose or suggest the claim limitations as contended by the Examiner, Applicants respectfully submit that Calvert does not disclose or suggest a method for forming an electrically conductive layer having patterns for semiconductor devices, *inter alia*, comprising the steps of forming a non-functional insulation layer on the substrate...forming a functional insulation layer on the non-functional insulation layer, the functional insulation layer having predetermined functional groups, as essentially claimed in claims 1, 15, and 22...". In response to this argument, Calvert et al. teach oxidizing the surface of a diamond layer, not oxidizing the diamond layer (Calvert et al., column 5, lines 16 – 34), wherein after the oxidation step a first insulating layer comprising diamond and a second insulating layer comprising oxidized diamond would be obtained.

### ***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Papers related to this application may be submitted directly to Art Unit 2823 by facsimile transmission. Papers should be faxed to Art Unit 2823 via the Art Unit 2823 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2823 Fax Center number is **(703) 305-3432**. The Art Unit 2823 Fax Center is to be used only for papers related to Art Unit 2823 applications.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Julio J. Maldonado** at **(703) 306-0098** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via [julio.maldonado@uspto.gov](mailto:julio.maldonado@uspto.gov). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 308-0956**.

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JMR  
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